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Soldiers give real-life feedback to Army engineers

By Paul Mehney

U.S. Army Tank Automotive Research, Development and Engineering Center

"We had no idea the Army actually works on this type of vehicle development," was a comment heard time and time again during Soldier feedback sessions held the week of Jan. 17 at the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC).

In order to help gather lessons learned feedback on numerous vehicle systems and to seek suggestions for product development, six Soldiers freshly seasoned from in Iraq were guests of TARDEC for three days.

The Soldiers, from the newly formed 4th Brigade Combat Team, 1st Cavalry Division, Fort Bliss, Texas, met with TARDEC leadership and participated in a variety of informal feedback sessions with TARDEC engineers and members from both the Program Executive Office for Combat Support & Combat Systems Support (PEO CS&CSS) and PEO Ground Combat Systems (PEO GCS).

To culminate the week's activities, the Soldiers received the opportunity to visit the Lima Army Tank Plant in Ohio, where they viewed Abrams SEP and Stryker production and reset efforts – a production experience not seen by many combat Soldiers.

TARDEC, as part of an overall Research, Development and Engineering Command goal of introducing more Soldiers to its laboratories and integrating feedback into real-time projects, initiated the visit with help from RDECOM staff. Although, according to one Soldier, "We were not too keen on coming all the way to Michigan," the sessions proved be educational and an enormous success for both the Soldiers and TARDEC staff.

Over the course of the three days, many panel sessions and hands-on interactive demonstrations took place that detailed vehicle crew cooling, long term armor strategies, tactical wheeled vehicle safety, Abrams and Bradley track issues, and the Light Urban Combat Vehicle (LUCV) concept.

The visit seemed a success for both sides – the Soldiers said they left feeling that they had a better understanding for what the Army is doing to solve real-world vehicle performance issues in a timely fashion, and TARDEC engineers were able to gather detailed feedback based on combat experience for product development.

"Feedback was continued throughout the visit and provided a multitude of realistic data for engineers at TARDEC," said Lt. Col. Alfred Grein, TARDEC's military deputy director. "Overall the trip was a great success, and was professionally rewarding for the Soldiers and TARDEC associates. First hand feedback is too valuable of an asset not to be included during program developments."

Upon the completion of the activities, it was suggested by both the RDECOM staff and the participating Soldiers that this type of visit be continued with various units on a periodic basis.

"I've been in the box [theater of combat operations] for a while now, and while I get ready to go back to the box and I feel better now knowing what's coming down the development pipeline that can help my Soldiers," said Command Sgt. Maj. Charlie Payne, 4-BTC.



Sgt. 1st Class Michael Green and Spc. Stephen Odell assess long term armor strategy after being briefed by TARDEC engineers and PEO CS&CSS.

Meal Cold Weather/Long Range Patrol menu revised to improve quality

The Army Research Laboratory's Major Shared Resource Center (MSRC) continues to upgrade its status as one of the most powerful computing sites in the world.

The Department of Defense High Performance Computing Modernization Program has ordered five supercomputers from Linux Networx, four of which will go to the MSRC located at Aberdeen Proving Ground, Md. Three of the supercomputers going to APG are Advanced Technology Clusters (ATC) and the other a mid-level LS-1 super system. A second LS-1 will go to the Dugway Proving Grounds, Utah.

The three ATC systems will be custom-designed for use at the MSRC and will be based on Intel dual-core 3.2 gigabyte processors. One of the systems, expected to be listed in the top 20 of the world's most powerful computer systems, will consist of 4,488 processors, another 3,336 and a third of 68 of the high-speed chips.

When the new systems come online this fall, the MSRC will more than double its processing power from about 37 to 80 "teraflops" or 80 trillion operations per second.

The ARL MSRC is one of four DoD Major Shared Source Centers serving the Defense community. Created under the High Performance Computing Modernization Program, it is one of the world's most powerful computer centers. The center's full spectrum of capabilities is used by DoD scientists and engineers to develop, test and field weapon systems faster and more efficiently.

TARDEC provides portable power, Hybrid Humvee receives field testing

By Ashley John
U.S. Tank Automotive Research, Development and Engineering Center

Nearly five years after the Meal, Cold Weather (MCW) and Food Packet, Long Range Patrol (LRP) merged into a single product, the subsequent 12 menus are now being revised.

Food technologists at the Natick Soldier Center's Combat Feeding Directorate held their first field evaluation in a decade of current and new menu items under consideration with Soldiers from the 51st Infantry in Darmstadt, Germany.

More than 80 Long Range Surveillance troops from Company E agreed to evaluate the LRP during training in Grafenwohr, Germany, in June 2005. They tried all of the items as part of a recently-funded program by the military to improve assault/special-purpose rations, said Vicki Loveridge, a senior food technologist on the Individual Combat Ration Team.

"We're trying to get some variety and take out products that are not doing well," Loveridge said. "We really didn't know the current relative acceptability of the menu items except for some of the components used in other rations."

She said many of the Soldiers were experienced and familiar with the rations, which brought a seasoned perspective, but it's taken a while for most troops to realize these types of rations are available. Orders increased during the second procurement of the Meal, Cold Weather/Long Range Patrol (MCW/LRP) from Soldiers and Marines serving in Afghanistan and Iraq.

"Anyone with a short-term, high-intensity mission where weight is critical or anyone who has a cold weather mission can order these for their use," Loveridge said.

The MCW/LRP is procured as a single ration for ease of supply but each has a different purpose.

The Ration, Cold Weather was redesigned five years ago into the MCW. Contained in white packaging, the MCW is substituted for the Meal, Ready-to-Eat (MRE) that in the past leaked after freezing and thawing, and contributed to hypothermia and dehydration in cold weather climates.

Freeze-dried entrees joined other dried foods for 1,540 calories per package, issued at three packages per day to provide 4,620 calories of nutrition. Warfighters would have to consume four MREs to get an equivalent amount of calories. A full day's ration is 1.5 pounds lighter than the MRE.

The MCW differs from the LRP in that sodium and protein content are controlled to decrease the need for water.

Loveridge said the merger of the two rations rescued the LRP from discontinuation. Wrapped in tan packaging, the LRP has only about a fifth of the production quantity of the MCW, but since they're mostly the same, the costs are low enough to remain in production.



A Soldier mixes water with an MRE to warm the meal. (Courtesy photos)

LRP rations go back to the 1960s, where they were popular among troops serving in Vietnam. They're designed for troops during an initial assault, conducting special operations or on long-range reconnaissance patrol, and are without re-supply for up to 10 days. Issued at one package per day, the ration weighs a half pound less than the MRE and has enough extra calories to give them what is needed to survive.

Soldiers have said that at least once a day they feel full, filling up on the entree containing 500-600 calories.

"At a focus group at the end of evaluation, Soldiers were saying that the entree was too big," said Loveridge. "I'd never heard that before."

Unheated water can be poured into the pouch holding the entree, which can slow hydration, and consequently, the acceptability of rice entrees, she said. Heated or unheated, water requirements don't change with dried foods.

"There's a misconception that you need extra water for dehydrated rations," Loveridge said. "You need a given amount of water per day depending on activity and temperature. Whether some of that comes in the food or is consumed separately, the water requirement is the same."

The current or "control" menu for the evaluation was modified in 2003. Cereal bars, granola bars and peanut brittle were pulled because they didn't meet minimum shelf life requirement of 80 degrees F for three years. Cappuccino, starch jellies, Combos, peanut butter M&Ms, chocolate sports bar, raisin nut mix, chocolate-covered cookie and fig bar were added to the menus.

This year's test menu brought new entrees of freeze-dried chicken teriyaki, Mexican rice and chicken, seafood chowder and chili macaroni with beef.

Trail mix, and peanut butter and banana walnut dessert bars were taken from the developmental First Strike Ration. Chocolate peanut butter, pizza cheese spread, smoked almonds, dried-fruit cranberries, brown sugar toaster pastry and granola were adopted from the MRE. Corn nuts, Walnettos, granola cereal with blueberries, cran-raspberry HooAH! bars and a freeze-dried ice cream sandwich are commercial items new to any individual ration.



Food Packet, Long Range Patrol and Meal, Cold Weather were merged into a single product five years ago. The subsequent 12 menus are now being revised to improve Soldier satisfaction.

A strawberry dairy shake, and fruit, lemon-lime and orange-flavored sports drinks are the remaining changes. All drink mixes in the MCW/LRP will be packed in the new zippered drink pouch for easier consumption.

At the focus group, Loveridge introduced candy-coated chocolate-covered coffee beans, honey gel pouches and energy fruit chews to gauge their level of interest. She said the coffee beans went fast and likely will be offered in the next evaluation.

As for the overall evaluation, Loveridge said the egg entrees and granola cereal were especially popular. Pending results from the evaluation and decisions from the Joint Operational Rations Forum, an updated list of menus is expected by next year.

For more information about the Soldier Systems Center, please visit our website at: <http://www.natick.army.mil>.

Researchers make breakthrough in phase shifter design and fabrication

By Dave Davison
Army Research Laboratory Public Affairs

Army Research Laboratory engineers are exploring ways to develop inexpensive electronic scanning antennas for unmanned aerial vehicles (UAV), radars and other applications. They made a recent breakthrough by successfully testing an eight-element phased array antenna using ARL-designed and fabricated RF (radiofrequency) MEMS (microelectromechanical system) phase shifters.

This demonstration is the most significant milestone so far in a three-year effort pursuing this technology to develop inexpensive electronic scanning antennas for unmanned aerial vehicles (UAV), radars and other applications. The recent successes have demonstrated the feasibility of MEMS switches and/or phase shifters enabling low-cost, low-power consumption electronically scanned antennas for multi-function RF use, missile seekers, and UAV communications and radar applications.

The research is another step towards multi-functional antennas capable of providing radar, secure communications and other radio frequency functions as well as being small enough to be hidden on or in the body of UAVs. The critical component driving performance in the MEMS phase shifters is the high performance, low loss MEMS switch. Through the development of both electrostatic and piezoelectric MEMS switches, the researchers have been able to demonstrate MEMS phase shifters operating at between 15 and 50 volts and with RF energy losses of less than 3 decibels.

These results were achieved by a collaborative effort of four different branches of ARL. They are Dan Judy, Andrew Bayba, Khamsouk Kingkao and Edward Viveiros, RF Electronics Branch; Ron Polcawich, Jeff Pulskamp, Madan Dubey, Richard Piekarz, Derwin Washington, and John Conrad, Micro-Devices Branch; Stephen Weiss, Millimeterwave Branch; and Dennis Martin, the Sensor Integration Branch. This successful test represents a major milestone in the effort to realize efficient and ultra-low cost phase shifters in the millimeter wave region of the spectrum.

Research on RF MEMS has been ongoing for more than a decade. This research has been strongly focused on developing robust, reliable MEMS switches and phase shifters for electronic scanning antenna (ESA) applications. Although MEMS switches and phase shifters have been demonstrated before, reliable low voltage switch operation and packaged phase shifters in an antenna array have yet to be demonstrated. The goal of the research program has been to develop a MEMS enabled ESA platform to evaluate MEMS phase shifter performance for military use.



Ron Polcawich, left, and Jeffrey Pulskamp, right, explains the operation of the first ARL designed and prototyped piezoelectric RF MEMS switch to John Miller, ARL director. In the back are others involved in the development of the switch, from left: Edward Burke, Daniel Judy, Dr. Paul Amirharaj, and Dr. Madan Dubey.



ARL researchers present Director John Miller with a plaque commemorating the first ARL developed and prototyped piezoelectric RF MEMS switch. Researchers, from left, are Edward Burke, Jeffrey Pulskamp, Ronald Polcawich, Miller, Daniel Judy, Dr., Paul Amirharaj, and Dr. Madan Dubey.

Natick Soldier Center named lab of the year for fourth time

Natick Soldier Center Public Affairs Release

The Natick Soldier Center, located at the U.S. Army Soldier Systems Center, has won the 2005 Department of the Army Research and Development Laboratory of the Year Award (Small Development Lab Category).

NSC has prevailed in the Small Development Lab Category three years consecutively and has won the award for four out of the past five years. The award is the most prestigious bestowed by the Army upon a research and development organization.

The Army mission of the NSC is to “maximize the Warrior’s survivability, sustainability, mobility, combat effectiveness and quality of life by treating the Warrior as a system.” NSC’s vision is to be “the recognized center and partner of choice for Warrior and homeland defender related research, technologies and systems.”

A panel of science and technology experts chose the winners by evaluating extensively the organization’s vision, strategy and business plans; strategic management of human capital; competitive sourcing; improved financial performance; use of expanded electronic government; budget and performance integration; major management achievements; and major technical achievements.

“This success is unparalleled and reflects the sustained top-notch performance and the exceptionally high caliber of the NSC workforce,” according to Philip Brandler, director of the NSC.

The lab received additional recognition as well. NSC, in partnership with the U.S. Army Research Institute of Environmental Medicine (USARIEM) and the U.S. Army Tank-Automotive Research, Development and Engineering Center (TARDEC), also received the Army Laboratory Collaboration Award for providing microclimate cooling for the Up-Armored High-Mobility Multipurpose Wheeled Vehicle (HMMWV) occupants, marking the first time that NSC won this team award. The NSC/USARIEM/TARDEC effort met an urgent battlefield requirement.

The NSC, USARIEM and TARDEC microclimate cooling collaboration was one of the numerous NSC contributions to the Global War on Terrorism and Homeland Security. In this area, NSC also contributed several Soldier protection systems, including body armor and face shield prototypes as well as protective shelters. The NSC made several other contributions to the Warfighter. NSC submitted the Army Combat Uniform as its most significant management accomplishment. The uniform came about as a result of an innovative management acquisition concept that used industry teams in nonstandard ways and eased communication between all key stakeholders. The integrated product team was made up of members from government, industry, and academia and included textile and component suppliers, apparel researchers, and Soldiers.

The streamlined acquisition management process reduced the development cycle from more than three years to one year. The initial fielding took place within six months after the final design approval was received from the Army Chief of Staff.

NSC’s trailblazing advances in biomechanics were submitted as its most significant technical accomplishment. The lab’s biomechanics work combines the disciplines of biology, physics and engineering, analyzes the effect of forces and torques on the human body, and quantifies human-equipment interactions in performing physical tasks.

NSC, working with USARIEM, addressed the issue of heavy load carriage, an ongoing problem for Soldiers, with the average approach march load being 101 pounds and the maximum emergence approach march load equaling 149 pounds.



The research provides for improved equipment design that enhances Soldier effectiveness by reducing potential injuries and reducing energy expenditure.

NSC biomechanics research has set the stage for work with the Military Amputee Research Program and the Defense Advanced Research Projects Agency's (DARPA) exoskeleton programs.

In the future, NSC plans to continue efforts to both save and improve the lives of the nation's Warfighters and Homeland Security/Homeland Defense first responders.

For more information about the Soldier Systems Center, please visit our website <http://www.natick.army.mil>.

CERDEC plays a proactive role in President Bush's initiatives for study of math, sciences.

By Dave Seltzer from C2D

Communications-Electronics Research, Development and Engineering Center

In his recent State of the Union address, President George Bush called for more spending for education in math and sciences and committed funding for his "competitiveness initiative" over the next ten years.

The Adopt a School Program is one means by which the Communications-Electronics Research, Development and Engineering Center plays a proactive role in supporting President Bush's educational plans to entice more students to study science, technology, engineering and mathematics.

CERDEC at Fort Monmouth, N.J., has signed an Adopt-a-School agreement with the Space Research Center (SPARC) Project at the Northeast High School in Philadelphia.

The SPARC project is part of a magnet program which attracts talented high school students from all parts of the city-wide 217,000 student population of the School District of Philadelphia.

The program promotes science, technology, engineering and mathematics in academically talented students and provides the students a program to successfully exercise full simulations of NASA manned missions.

The project was started in 1959 by science teacher, Robert A. J. Montgomery and a group of innovative and adventurous students. The project tried to capture the imagination and creativity of the local high school students and motivate them toward studies in science and engineering.

They succeeded in building a mock-up of the orbiter capsule in a backstage corner of the school auditorium and performed missions in parallel with those of the NASA astronauts. CERDEC engineer, David Seltzer, then a high school senior and chief of the stage crew, was among the creators of this bold new project.

In 1963, propelled by the highly visible student project and the publicity created by news and television coverage, a new wing was added to the main building and the SPARC Project was born. The current Magnet Program comprises 550 students and 25 teachers. The SPARC Project comprises 85 students and five teachers. The SPARC facility currently consists of eight mission control consoles, eight communications consoles and a 21-foot mock-up of the space shuttle including a flight deck and crew deck. (www.nehs.phila.k12.pa.us/slc/magnet/project_sparc.htm)

Earlier this year, David Seltzer, now a senior electronics engineer with the CERDEC's Command and Control Directorate, was clearing out some motion capture equipment from an old project. The innovativeness of this past project brought to mind another innovative project, and a thought "How is Project SPARC doing, and could they use equipment like this?"

A phone call to the school introduced him to Margaret Karpinski, the new director of Project SPARC and her mission, to update the program to keep pace with the new NASA "The Earth, Moon, Mars and Beyond" initiative.

Drawing on the resources at Fort Monmouth, Seltzer then contacted Dr. Constella Zimmerman, who runs the CERDEC's outreach programs, and the adopt-a-school concept was initiated. Coordination with Margaret Sesta, and



Dr. Constella Zimmerman CERDEC HQ, David Seltzer C2D and members of the SPARC staff and Engineering Team students. (Courtesy photo)



her team at the Property Accountability Branch of the Directorate of Logistics, employed the Computers For Learning program to provide computers and other equipment to the program.

Seltzer has applied his engineering expertise to develop a series of student programs which will contribute to the major SPARC program team areas and will create science fair projects with a goal of getting SPARC students into the National Science Fair competition. Additionally, he has drawn up designs to modify the existing shuttle mock-up to add overnight sleeping quarters for the shuttle crew of four, a three module International Space Station and a 5 feet by 15 feet robotics development and display area.

He and the staff at SPARC coordinate with Matt Keil of the NASA Goddard Space Flight Center to advance the current shuttle-based program to the future notional space flight vehicles for "the Earth, Moon, Mars and Beyond."

At the end of each scholastic year, a simulated mission, lasting between one and eight days, is performed involving 75 students as specialist in seven teams. The groups are comprised of flight management, spacecraft communications, computer networking, spacecraft design and engineering, electronics, rocketry, robotics, and medical teams in either the mission operations center or onboard the spacecraft. Software development activities are also required in support of these simulations.

The annual flights have been dedicated to astronauts such as Neil Armstrong and John Glenn, shuttle crews and other pioneers in space travel. The annual flight scheduled for April 26-27 will be dedicated to Dave Seltzer and the CERDEC support which is instrumental in the modernization of the Northeast High School Space Research Center and the Science, Technology and Engineering Magnet Program.

New partnership looks to improve physical capabilities of military amputees

Natick Soldier Center Public Affairs Release

The Natick Soldier Center, the U.S. Army Research Institute of Environmental Medicine (USARIEM), and the Walter Reed Army Medical Center's Military Amputee Research Program (MARF) have entered into a Memorandum of Understanding (MOU) to improve physical performance of military amputees.

"The goal of the program is to sponsor and conduct research that provides military amputees with the best technology and treatment possible, including rehabilitation," said Dr. John Obusek, ergonomics team leader, NSC. The objective is to help amputees achieve a level of physical capability that is compatible with continued service on active duty."

Under the MOU, NSC and USARIEM are collaboratively applying their knowledge in Soldier biomechanics and human performance to evaluate the capabilities of the amputee relative to the physical requirements demanded of all Soldiers, according to Obusek.

Scientists at the Biomechanics Lab will study the effect of various forces on human movement. Amputee Soldiers will be studied running, jumping, and using military packs.

NSC and USARIEM scientists are specialists in the field of biomechanics. NSC and USARIEM already work together in a joint program focusing on biomechanics studies and investigating ways to avoid injury and improve Soldier performance. NSC is considered the leading expert on the biomechanics of Soldier tasks, including military load carriage.

NSC's Biomechanics Laboratory is a unique facility housing equipment capable of three-dimensional analysis of human movement, measurement of external forces on the body, monitoring of muscle activity, and real-time mapping of pressure patterns associated with wear of clothing and equipment.

According to Obusek, NSC's Biomechanics Laboratory has state-of-the-art motion capture systems and a patented dual force plate treadmill necessary for this type of study.

Walter Reed's Military Amputee Training Center and its U.S. Army Amputee Patient Care Program opened a year ago in November. The center brings together all aspects of amputee patient care and addresses the medical and rehabilitation needs of Soldiers.

The work performed under the new MOU will benefit both Soldiers seeking to return to active duty as well as those who are not.



Under the agreement, the capabilities of amputees will be evaluated relative to the physical requirements demanded of all Soldiers. This Soldier participates in an unrelated study in NSC's Biomechanics Laboratory. (Courtesy photo)



"All military amputees will benefit from the output of this program, whether it is their intent to remain on active duty or not," Obusek said. "Advances in both prosthetic technology and treatment that arise from this program will certainly have direct application to civilian amputees as well, as has been the case historically following other major conflicts."

For more information about the U.S. Army Soldier Systems Center, please visit our website at: <http://www.natick.army.mil>.

Embeddable “Military-Rated” GPS Receiver right GPS solution for many Army weapon systems

By Don Mulligan

Product Manager – Global Positioning System, Fort Monmouth N.J.

PM GPS recently announced the availability of the improved Ground-Based GPS Receiver Applications Module (GB-GRAM). The principle change from the GB-GRAM first introduced in 2003 is the upgraded Selective Availability Anti Spoof Module (SAASM).

What is GB-GRAM? A GB-GRAM is a “military-rated” embeddable lightweight circuit card assembly containing a 12-channel, dual-frequency, continuous-tracking GPS receiver. It uses state-of-the-art receiver technology including “All-in-view” satellite tracking, accelerated Direct-Y and C/A code acquisition and SAASM signal security. GB-GRAM is designed to provide a low-cost standardized embeddable GPS product solution.

“Military-rated” means GB-GRAM utilizes SAASM technology to access the Precise Positioning Service (PPS) component of the GPS signal. GPS satellites generate two levels of navigation service: PPS and Standard Positioning Service (SPS). PPS is reserved for the exclusive use of US and Allied combat forces and other DoD authorized users. All other users are limited to the SPS signal using commercial GPS receivers.

Why PPS? It provides authorized users with greater accuracy, enhanced anti-spoofing and anti-jam protections. Just remember that military GPS receivers must be keyed with COMSEC to access the PPS signal.

DoD Policy is firmly behind PPS. In November 1998, Joint Staff policy CJCSI 6140.01 directed the use of SAASM-based GPS for handheld systems, installed systems and the retrofit of existing weapons systems. In August 2000, ASD/C3I issued GPS Security Policy directing DoD users to incorporate PPS equipment on all systems used for combat, combat support and combat service support missions. Today, the fielding of new or modified systems without a SAASM-based GPS receiver requires an ASD/C3I waiver.

A growing number of DoD weapons systems are using GB-GRAM to comply with the SAASM-based GPS requirement. Two examples illustrated here are the M1A2 Abrams tank and the Movement Tracking System.

GB-GRAM is currently produced in the Small Serial Interface (SSI) form factor, measuring about 3.5 by 2.5 inches and weighing under 4 ounces. PM GPS is open to developing alternative form factors such as the PCMCIA card or a smaller footprint if host systems present such requirements. PM GPS has developed a PLGR-shaped “box” to hold a GB-GRAM. This creative solution provides multiple data ports allowing a weapons system manager to replace up to three PLGR (or DAGR) on a platform where circumstances might preclude embedding the GB-GRAM.

Operationally, GB-GRAM provides robust, real-time position, velocity, navigation and timing (PVNT) data 24 hours a day under all weather conditions. Technically, GB-GRAM can monitor up to 10 satellites simultaneously with “All-in-view” tracking technology. (the other channels are used for maintenance activities). The GB-GRAM is also faster off the mark, being quicker to access PPS codes than previous GPS receivers.



GB-GRAM receiver on a card . (Courtesy photos)



In 2003, the Army at Fort Monmouth N. J. established a contract for GB-GRAM production. Purchases from DoD weapons system managers are consolidated for Economic Order Quantity (EOQ) pricing benefits. Over 9,000 GB-GRAM have been ordered to date on a routine semi-annual order basis or as needed for urgent requirements.

GB-GRAM allows weapons systems to discontinue the use of cabled external GPS devices like the PLGR or DAGR, reducing the components, logistics and weight of a weapon system. It also frees up handheld GPS devices needed by ground-mobile soldiers.

GB-GRAM is part of a family of standardized embeddable military GPS receivers, each tailored to the operating dynamics of aircraft, munitions and other host systems. As the name implies, the Ground-Based GRAM is designed for the operating dynamics of dismounted troops and ground-mobile platforms. It is also suitable for watercraft and low dynamic aircraft such as Unmanned Aerial Vehicles or UAVs.

Unlike previous GPS receivers, GB-GRAM is a Class IX component part not a Class VII end-item. This means that Army PM GPS does not field the GB-GRAM but facilitates its purchase by weapon system managers and provides technical support for platform integrations.

GB-GRAM fulfills the GPS Tactical Receiver (GTR) Operational Requirements Document (ORD) for a state-of-the-art embeddable GPS receiver.

GB-GRAM doesn't have the "bells and whistles" of the latest handheld GPS receiver/radio. When embedded to a weapon system, GB-GRAM is not visible to the average user. Nevertheless, GB-GRAM is destined to play a key role across the Army and other military services by providing a robust SAASM-based GPS capability to Warfighters while reducing the cost, weight and logistics of the host weapon system.



Cargo trucks equipped with Movement Tracking System (MTS) use GB-GRAM installed to the MTS box.

RDECOM engineer saves Army \$10 Million with suggestion

By Trinace Johnson

**Research, Development and Engineering Command Public
Communications Office**

A U.S. Army electronics engineer saved the government \$10 million with his suggestion to improve existing design tools and libraries for an Army program.

Jerry Dickson, of the Aviation and Missile Research, Development and Engineering Center (AMRDEC), Redstone Arsenal, Ala. was announced as the Department of the Army 2005 Civilian Suggester of the Year.

Dickson led a design effort to overcome a technical roadblock that endangered a \$250 million program.

His efforts resulted in a new drop-in-power amplifier module for the successful completion of the on-going \$250 million continuing development contract and upcoming flight test program of the Brilliant Anti-Tank (BAT) Pre-Planned Product Improvement (P3I). The BATP3I is used as a homing device on a specific target's acoustic, thermal and millimeter wave radar signatures. Dickson also developed the necessary manufacturing processes and techniques to ensure successful delivery of the amplifier module.



Jerry Dickson

He successfully completed delivery of 86 fully tested and qualified power amplifier modules on schedule and did it at nearly \$1 million under cost.

"I was completely surprised by the selection," Dickson said. "It was a team endeavor from start to finish. Personnel from Fort Monmouth [N. J.] supported me un-relentlessly as did my contracting officer. Perhaps the thing that I am proudest of is the support that I got from the project office... they stuck with me all the way," he said.

Dickson has 18 years of civil service with the government, and four years of military experience. He has three U.S. patents and authored more than 40 publications and technical reports.

Dickson has performed pioneering work in the application of pseudomorphic high electron mobility transistors low noise amplifiers, image reject mixers, and power amplifiers. Dickson developed the first active W-band receiver that employed a low noise amplifier with an image rejection mixer and the first W-band MMIC power amplifier module. He conceived and implemented a Manufacturing Technology project that saved the Longbow Program over \$40 million on the RF transmitter and receiver.

He graduated with honors with a Bachelor of Science Degree in electrical engineering from Memphis State University. Dickson is presently attending the University of Alabama in Huntsville, working on his master's degree in aeronautical engineering with a concentration in missile systems engineering.

AMSAA employees complete Defense Leadership and Management Program

By Trinace Johnson
Research, Development and Engineering Command Public Communications Office

Two U.S. Army Materiel Systems Analysis Activity employees were part of 74 competitively selected participants who recently completed the Defense Leadership and Management Program and were honored in a ceremony in Arlington, Va., last month.

DLAMP is a DoD developmental program designed to grow civilian leaders through joint training and education.

Patrick J. O'Neill and Patricia Cook graduated from the DLAMP Feb. 7, in a ceremony filled with distinguished guests who included Francis J. Harvey, Secretary of the Army, Gordon England, Deputy Secretary of Defense and David S. C. Chu, Under Secretary of Defense for Personnel and Readiness.



Patrick J. O'Neill holds up his DLAMP certificate and is congratulated by Patricia Bradshaw, Deputy Under Secretary of Defense for Civilian Personnel Policy. (Courtesy Photo)

"We [O'Neill and Cook] hoped to continue to develop our leadership skills, as well as gain significant experience," O'Neill said. Through DLAMP, O'Neal said he gained a greater shared understanding, trust and sense of mission with military counterparts, plus strong leadership and management skills.

Both Cook and O'Neill were nominated for DLAMP by David Shaffer, AMSAA director.

"We at AMSAA are very proud of the accomplishments of Mr. O'Neill and Mrs. Cook," Shaffer said.

"DLAMP is a very extensive Executive Development program which demanded a significant commitment from these individuals. They both attended many graduate-level courses as well as completed Senior Service Colleges at the Industrial College of the Armed Forces and the Army War College. This level of professional development is absolutely critical for individuals who desire to compete for positions in the Senior Executive Service," Shaffer said.

Cook said she saw the experience as a way to expand in many executive areas and expand at the Army War College.

"I decided to apply for the program because it was billed as the means to prepare for a SES [senior executive service] position and have the SES competencies already fulfilled," Cook said.

"We are both proud of our participation in DLAMP and grateful for AMSAA's support," O'Neill added. "Our DLAMP experiences will pay dividends for the rest of our careers as well as in our personal lives," O'Neill said.

"Both of these individuals have worked very hard at their professional development and as a result are currently occupying senior management positions at AMSAA. DLAMP has well prepared them to be very successful not only in their current jobs but has also developed them for key leadership positions in the future," Shaffer added.

According to the DLAMP website, it is a comprehensive program of education and development. Most participants will complete all requirements in two to five years, depending on their prior education, career goals and individual needs.

Each year, up to 350 new participants are admitted to DLAMP through a competitive selection process.

Acquisition Charter Presented

Gary Martin, director of Communication-Electronics Research Development and Engineering Center (Center), is presented a charter naming him the Acquisition Career Management Advocate for CERDEC, by Lt. Gen. Joseph Yakovac, Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology, (far left) and Maj. Gen. Roger Nadeau, commander for the Research Development and Engineering Command. The Charter was presented at the recent AUSA Conference in Ft. Lauderdale, Fla.



Courtesy Photo